

Fig. 1

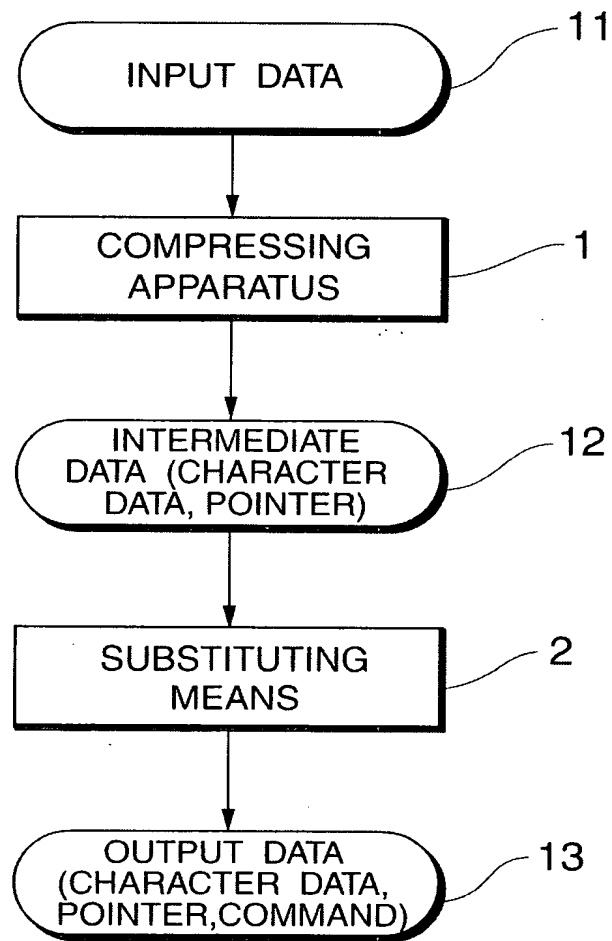


Fig.2

Input stream for encoding:

Pos 1 2 3 4 5 6 7 8 9 10 11

Char A A B B C B B A A B C

Table 1:

The encoding process

(MIN_LENGTH=2)	Step	Pos	Match	Output
	1	1	–	A
	2	2	A	A
	3	3	–	B
	4	4	B	B
	5	5	–	C
	6	6	BB	(3,2)
	7	8	AAB	(7,3)
	8	11	C	C

Fig.3

$\langle \text{Compressed Stream} \rangle := [\langle \text{Compressed String} \rangle] \langle \text{End Marker} \rangle$
101
102
103

$\langle \text{Compressed String} \rangle := 0 \langle \text{Raw Byte} \rangle \mid 1 \langle \text{Compressed Bytes} \rangle$
104
105

$\langle \text{Raw Byte} \rangle := \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (8-bit byte)
 $\langle \text{Compressed Bytes} \rangle := \langle \text{Offset} \rangle \langle \text{Length} \rangle$
106
107

$\langle \text{Offset} \rangle := 1 \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (7-bit offset)
 $0 \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (11-bit offset)

$\langle \text{End Marker} \rangle := 110000000$

$\langle b \rangle := 1 \mid 0$

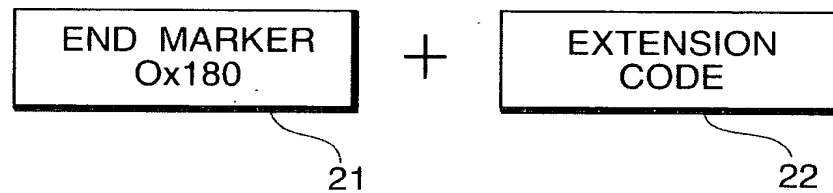
$\langle \text{Length} \rangle :=$

00 = 2	1111 0110 = 14
01 = 3	1111 0111 = 15
10 = 4	1111 1000 = 16
1100 = 5	1111 1001 = 17
1101 = 6	1111 1010 = 18
1110 = 7	1111 1011 = 19
1111 0000 = 8	1111 1100 = 20
1111 0001 = 9	1111 1101 = 21
1111 0010 = 10	1111 1110 = 22
1111 0011 = 11	1111 1111 0000 = 23
1111 0100 = 12	1111 1111 0001 = 24

1111 0101 = 13 ...

Fig.4

(a) ADDITION OF COMMAND



(b) EXPANSION OF COMMAND
(CONTENTS OF EXTENSION CODE)

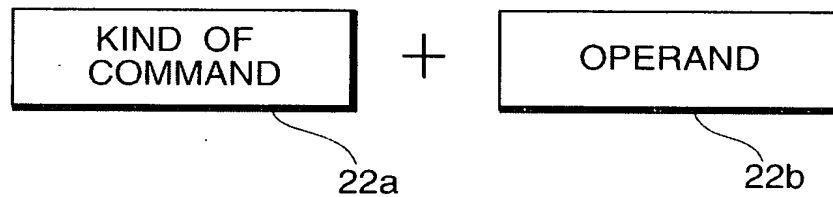


Fig.5

KIND OF COMMAND	CODE	MEANING
END MARKER	$\boxed{0x180} + \boxed{0x0}$	END OF OUTPUT DATA
DATA CONTROL COMMAND	$\boxed{0x180} + \boxed{0x1} + \boxed{(B,L,N)}$	THE L CHARACTER DATA STRINGS FROM A POSITION BEFORE B STRINGS ARE REPEATED N TIMES.
POINTER CONTROL COMMAND	$\boxed{0x180} + \boxed{0x2} + \boxed{(B,L)}$	THE POINTER FROM A POSITION BEFORE B POINTERS IS REPEATED N TIMES.
OUTPUT DATA STRING CONTROL COMMAND	$\boxed{0x180} + \boxed{0x3} + \boxed{(B,L,N)}$	THE L OUTPUT DATA STRINGS FROM A POSITION BEFORE B STRINGS ARE REPEATED N TIMES.
DATA CONTROL COMMAND	$\boxed{0x180} + \boxed{0x4} + \boxed{(B,L,M,C)}$	THE MTH DATA OF THE L CHARACTER DATA STRINGS FROM A POSITION BEFORE B STRINGS IS CHANGED TO C AND OUTPUTTED.
POINTER CONTROL COMMAND	$\boxed{0x180} + \boxed{0x5} + \boxed{(B1,B2)}$	THE CHARACTER DATA STRINGS INDICATED BY THE POINTERS P1 AND P2 ARE COUPLED AND OUTPUTTED.
...
PASSWORD SETTING COMMAND	$\boxed{0x180} + \boxed{0xD} + \boxed{(PW)}$	THE PASSWORD PW IS SET.
COPYRIGHT INFORMATION SETTING COMMAND	$\boxed{0x180} + \boxed{0xE} + \boxed{(CR)}$	THE COPYRIGHT INFORMATION CR IS SET.
SCM COMMAND	$\boxed{0x180} + \boxed{0xF} + \boxed{(CM)}$	THE COMMENT CM IS INSERTED.

NOTE: B: 7 BITS, N: 4 BITS, L: 8 BITS, M: 8 BITS, C: 8 BITS.

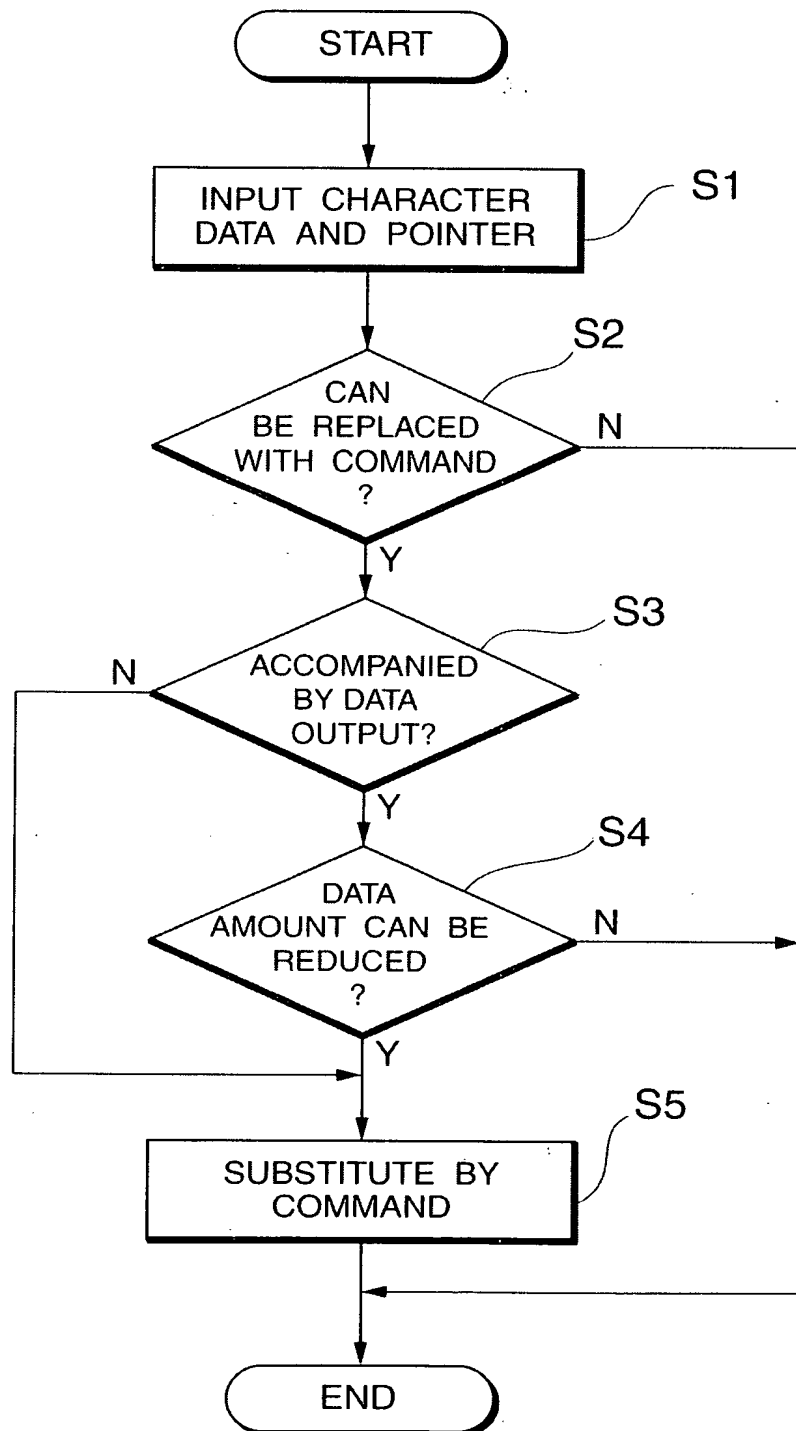
Fig.6

Fig. 7

(1) SUBSTITUTION OF POINTERS INDICATING THE SAME CHARACTER STRING:

WHEN THE POINTERS P1 AND P2 INDICATING THE SAME CHARACTER STRING C ARE DETECTED, THE LATTER POINTER P2 IS REPLACED WITH THE COMMAND RP(B, L) IN WHICH THE FORMER POINTER P1 IS REPEATED.

「...C.P1..P2....」 → 「...C..P1..RP....」

(2) SUBSTITUTION OF 2 ADJACENT POINTERS:

THE 2 ADJACENT POINTERS P1 AND P2 ARE REPLACED WITH ONE COMMAND CP(B1, L1, B2, L2) FOR COUPLING THE 2 POINTERS.

「...P1P2....」 → 「...CP....」

(3) SUBSTITUTION OF POINTER INDICATING THE CHARACTER STRING INCLUDING ONE DIFFERENT CHARACTER

WHEN THE POINTER P2 INDICATING THE CHARACTER STRING C2 IN WHICH ONE CHARACTER DIFFERS FROM THAT IN THE POINTER P1 INDICATING THE CHARACTER STRING C1 IS DETECTED, THE LATTER POINTER P2 IS REPLACED WITH THE COMMAND OMD(B, L, M, C) FOR CHANGING THE ONE DIFFERENT CHARACTER IN THE CHARACTER STRING C1 OF THE FORMER POINTER P1.

「...C1...C2..P1..P2....」 → 「...C1...C2..P1..OMD....」

Fig.8**(a)INPUT CHARACTER STRINGS**

ABC	ABC	ABC	ABC	ABC	ABC	D.....
(24)	(24)	(24)	(24)	(24)	(24)	144 BITS IN TOTAL

(b)OUTPUT DATA ACCORDING TO LZSS

ABC	(3,3)	(6,6)	(12,6)	D.....
(27)	(11)	(13)	(13)	64 BITS IN TOTAL

**(c)OUTPUT DATA ACCORDING TO
EMBODIMENT OF THE INVENTION**

ABC	(3,3)	<u>RP(1,4)</u>	D.....
(24)	(11)	(24)	62 BITS IN TOTAL

**(d)OUTPUT DATA ACCORDING TO
EMBODIMENT OF THE INVENTION**

ABC	<u>RD(3,3,5)</u>	D.....
(27)	(32)	59 BITS IN TOTAL

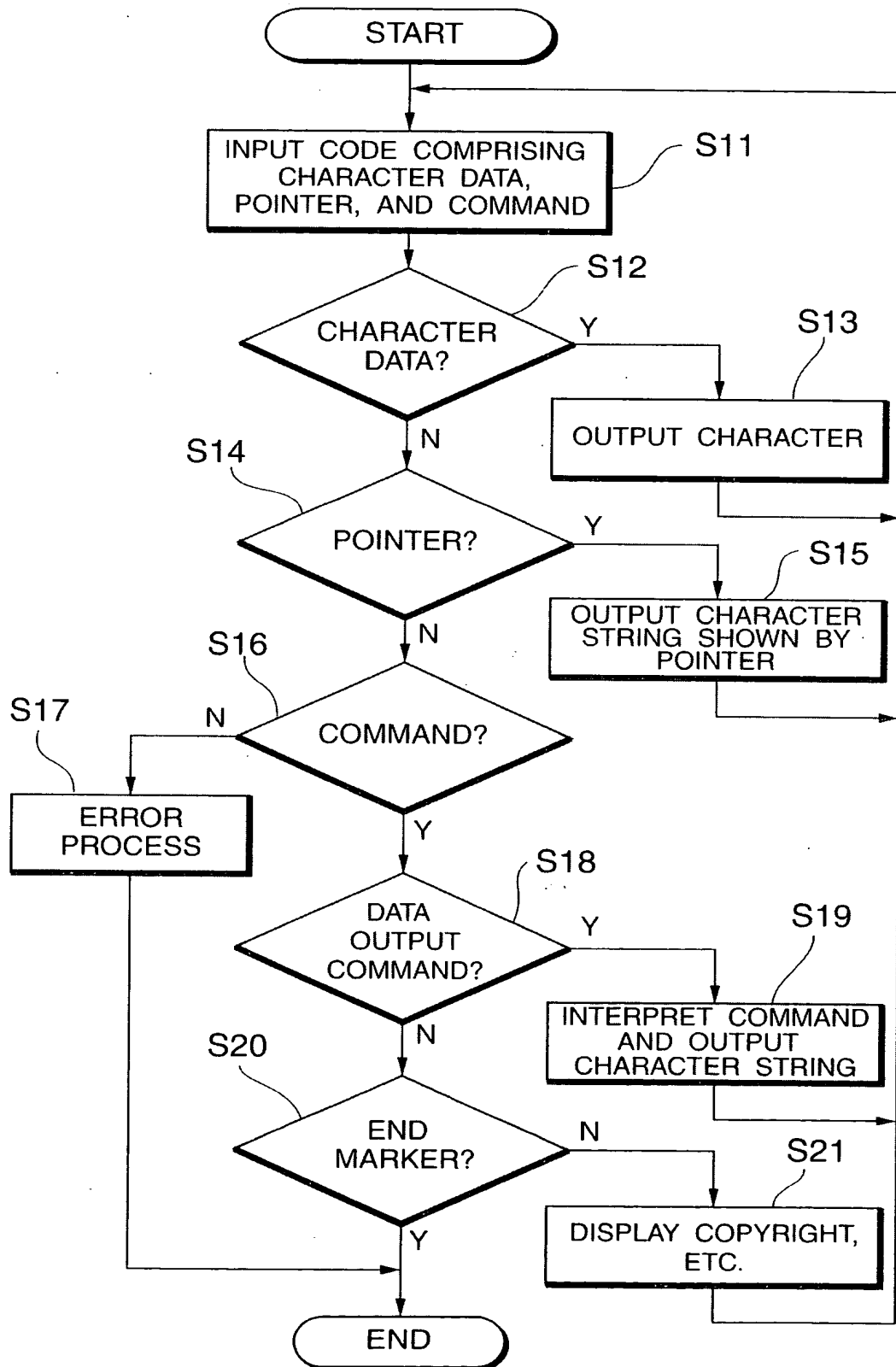
Fig.9

Fig. 10

$\langle \text{Compressed Stream} \rangle := [\langle \text{Compressed String} \rangle] \langle \text{End Marker} \rangle$
201 202 203

$\langle \text{Compressed String} \rangle := 0 \langle \text{Raw Byte} \rangle \mid 1 \langle \text{Command/Pointer} \rangle$
204 205

$\langle \text{Raw Byte} \rangle := \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (8-bit byte)

$\langle \text{Command/Pointer} \rangle := 1 \langle \text{Command} \rangle \mid 0 \langle \text{Pointer} \rangle$
206 207

$\langle \text{Command} \rangle := \langle \text{Command Set} \rangle \langle \text{Operand} \rangle$
208 209

$\langle \text{Command Set} \rangle := \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (4-bit)
 $\langle \text{End Marker} \rangle := 110000$

$\langle \text{Pointer} \rangle := \langle \text{Offset} \rangle \langle \text{Length} \rangle$
210 211

$\langle \text{Offset} \rangle :=$
 $1 \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (6-bit offset)
 $0 \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle \langle b \rangle$ (11-bit offset)

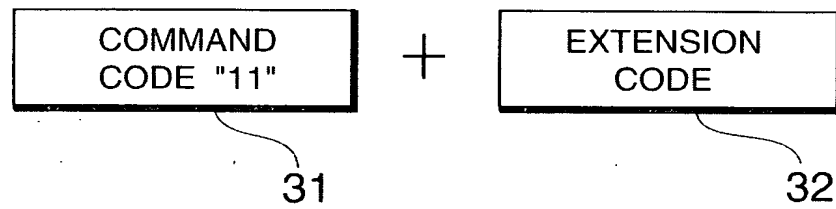
$\langle b \rangle := 1 \mid 0$

$\langle \text{Length} \rangle :=$

00 = 2	1111 0110 = 14
01 = 3	1111 0111 = 15
10 = 4	1111 1000 = 16
1100 = 5	1111 1001 = 17
1101 = 6	1111 1010 = 18
1110 = 7	1111 1011 = 19
1111 0000 = 8	1111 1100 = 20
1111 0001 = 9	1111 1101 = 21
1111 0010 = 10	1111 1110 = 22
1111 0011 = 11	1111 1111 0000 = 23
1111 0100 = 12	1111 1111 0001 = 24
1111 0101 = 13 ...	

Fig. 11

(a) ADDITION OF COMMAND



(b) EXPANSION OF COMMAND
(CONTENTS OF EXTENSION CODE)

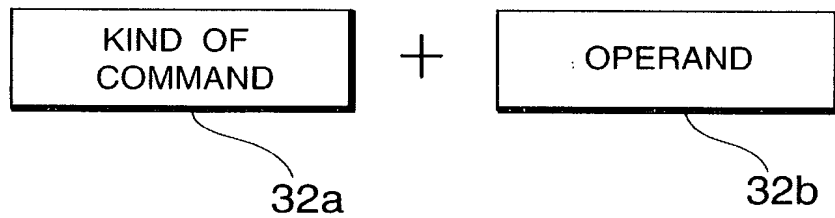


Fig. 12

KIND OF COMMAND	CODE	MEANING
END MARKER	$\boxed{\text{11J}} + \boxed{0x0}$	END OF OUTPUT DATA
DATA CONTROL COMMAND	$\boxed{\text{11J}} + \boxed{0x1} + \boxed{(B,L,N)}$	THE L CHARACTER DATA STRINGS FROM A POSITION BEFORE B STRINGS ARE REPEATED N TIMES.
POINTER CONTROL COMMAND	$\boxed{\text{11J}} + \boxed{0x2} + \boxed{(B,L)}$	THE POINTER FROM A POSITION BEFORE B POINTERS IS REPEATED N TIMES.
OUTPUT DATA STRING CONTROL COMMAND	$\boxed{\text{11J}} + \boxed{0x3} + \boxed{(B,L,N)}$	THE L OUTPUT DATA STRINGS FROM A POSITION BEFORE B STRINGS ARE REPEATED N TIMES.
DATA CONTROL COMMAND	$\boxed{\text{11J}} + \boxed{0x4} + \boxed{(B,L,M,C)}$	THE MTH DATA OF THE L CHARACTER DATA STRINGS FROM A POSITION BEFORE B STRINGS IS CHANGED TO C AND OUTPUTTED.
POINTER CONTROL COMMAND	$\boxed{\text{11J}} + \boxed{0x5} + \boxed{(B1,B2)}$	THE CHARACTER DATA STRINGS INDICATED BY THE POINTERS P1 AND P2 ARE COUPLED AND OUTPUTTED.
...
PASSWORD SETTING COMMAND	$\boxed{\text{11J}} + \boxed{0xD} + \boxed{(PW)}$	THE PASSWORD PW IS SET.
COPYRIGHT INFORMATION SETTING COMMAND	$\boxed{\text{11J}} + \boxed{0xE} + \boxed{(CR)}$	THE COPYRIGHT INFORMATION CR IS SET.
SCM COMMAND	$\boxed{\text{11J}} + \boxed{0xF} + \boxed{(CM)}$	THE COMMENT CM IS INSERTED.

NOTE: B: 7 BITS, N: 4 BITS, L: 8 BITS, M: 8 BITS, C: 8 BITS.

Fig. 13

KIND OF COMMAND	CODE	MEANING
CHARACTER STRING DEFINITION COMMAND	$\boxed{\text{11}} + \boxed{0x8} + \boxed{(B,L,M)}$	THE L CHARACTER STRINGS FROM A POSITION BEFORE B STRINGS IS DESIGNATED AS THE MTH CHARACTER STRING.
CHARACTER STRING DEFINITION OUTPUT COMMAND	$\boxed{\text{11}} + \boxed{0x9} + \boxed{(B,L,M)}$	THE L CHARACTER DATA STRINGS FROM A POSITION BEFORE B STRINGS IS DESIGNATED AS THE MTH CHARACTER DATA STRING AND THIS CHARACTER STRING IS OUTPUTTED.
POINTER DEFINITION COMMAND	$\boxed{\text{11}} + \boxed{0xA} + \boxed{(M)}$	THE POINTER JUST BEFORE IS DESIGNATED AS THE MTH POINTER.
CODE SUBSTITUTION COMMAND	$\boxed{\text{11}} + \boxed{0xB} + \boxed{(M)}$	THE MTH CHARACTER STRING DESIGNATED BY THE CS COMMAND OR THE LIKE IS REPLACED WITH THE CODE.

NOTE: B: 7 BITS, L: 8 BITS, M: 5 BITS.

Fig. 14

(a) STOP ACCORDING TO THE ORDER

ORDER (M)	CHARACTER STRING	POINTER	FREQUENCY OF APPEARANCE (T)
1	S1	P1	18
2	S2	P2	12
3	S3	P3	10
4	S4	P4	9
⋮	⋮	⋮	⋮
31	S31	P31	4
32	S32	P32	4
33	S33	P33	4

STOP ON THE BASIS
OF THE ORDER M

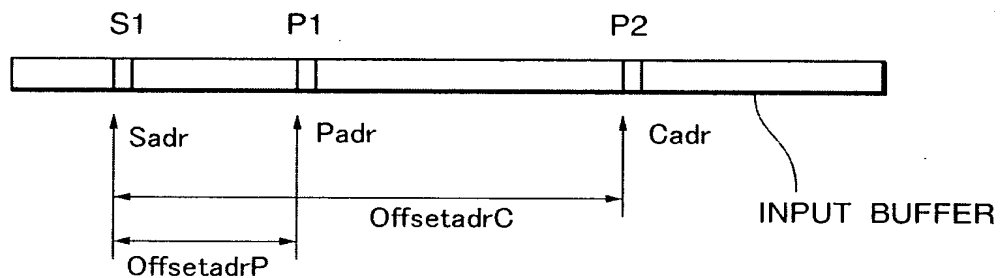
(a) STOP ON THE BASIS OF THE
FREQUENCY OF APPEARANCE

ORDER (M)	CHARACTER STRING	POINTER	FREQUENCY OF APPEARANCE (T)
1	S1	P1	12
2	S2	P2	8
3	S3	P3	7
4	S4	P4	6
⋮	⋮	⋮	⋮
16	S16	P16	3
17	S17	P17	2
18	S18	P18	2

STOP ON
THE BASIS
OF THE
FREQUENCY
T

Fig.15

{ DISCRIMINATING CONDITION 1: THE NUMBER OF CHARACTERS
 OF S1 IS THE SAME.
 { DISCRIMINATING CONDITION 2: $Cadr - Pdr = OffsetadrC - OffsetadrP$



S1: CHARACTER STRING

P1: POINTER SHOWING S1

P2: POINTER SHOWING S1

Sadr, Pdr, Cadr: RELATIVE ADDRESSES IN INPUT BUFFER

OffsetadrP, OffsetadrC: RELATIVE ADDRESSES SHOWING OFFSET VALUES

Fig.16

DESIGNATED ORDER (M)	DEFINITION COMMAND	VALID/INVALID FLAG
1	SDO(B,L,M)	1
2	SD(B,L,M)	1
3	PD(B,L,M)	1
4	SDO(B,L,M)	1
⋮		⋮
16	SDO(B,L,M)	1
17	——	0
⋮	⋮	⋮
32	——	0

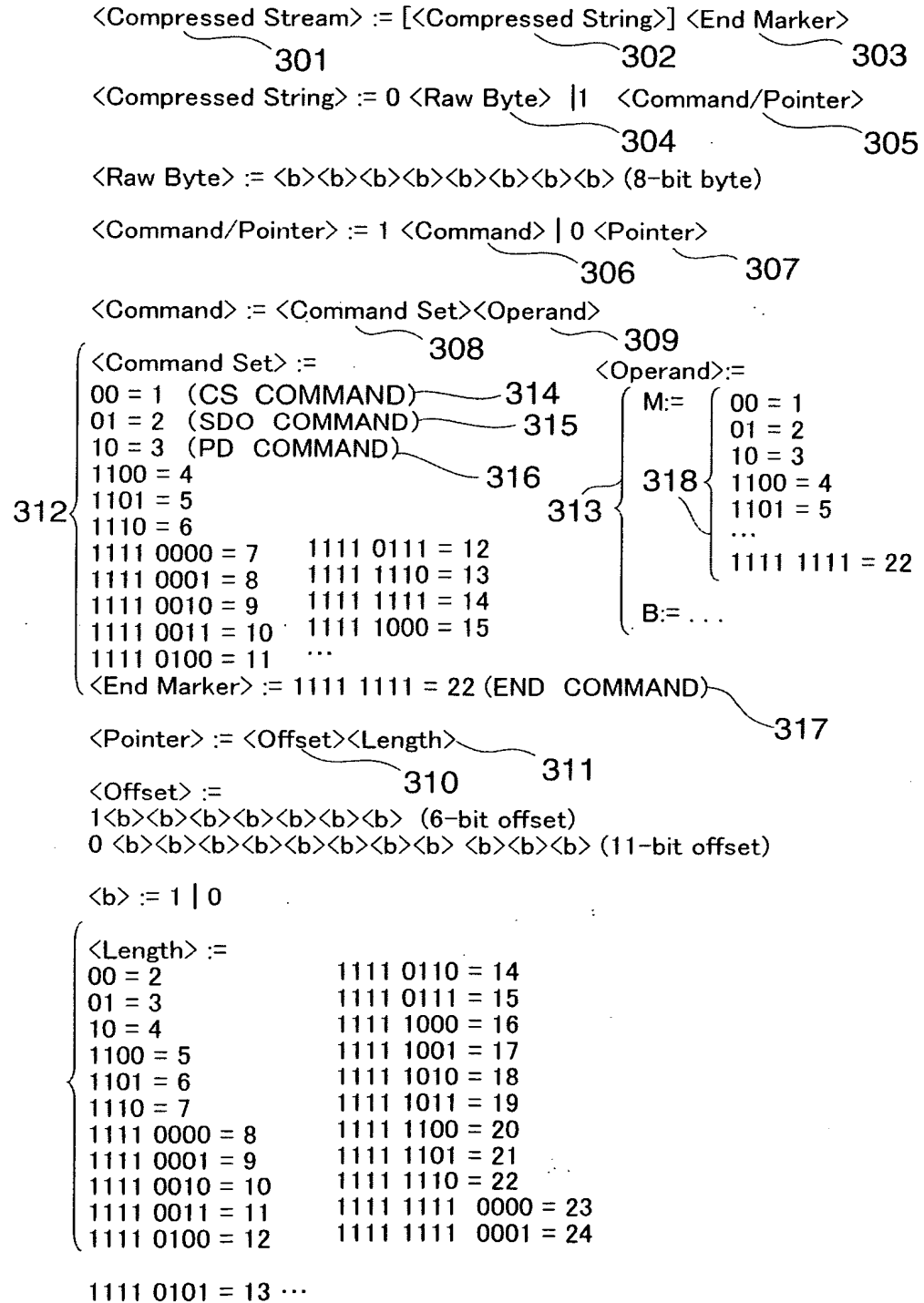
Fig.17

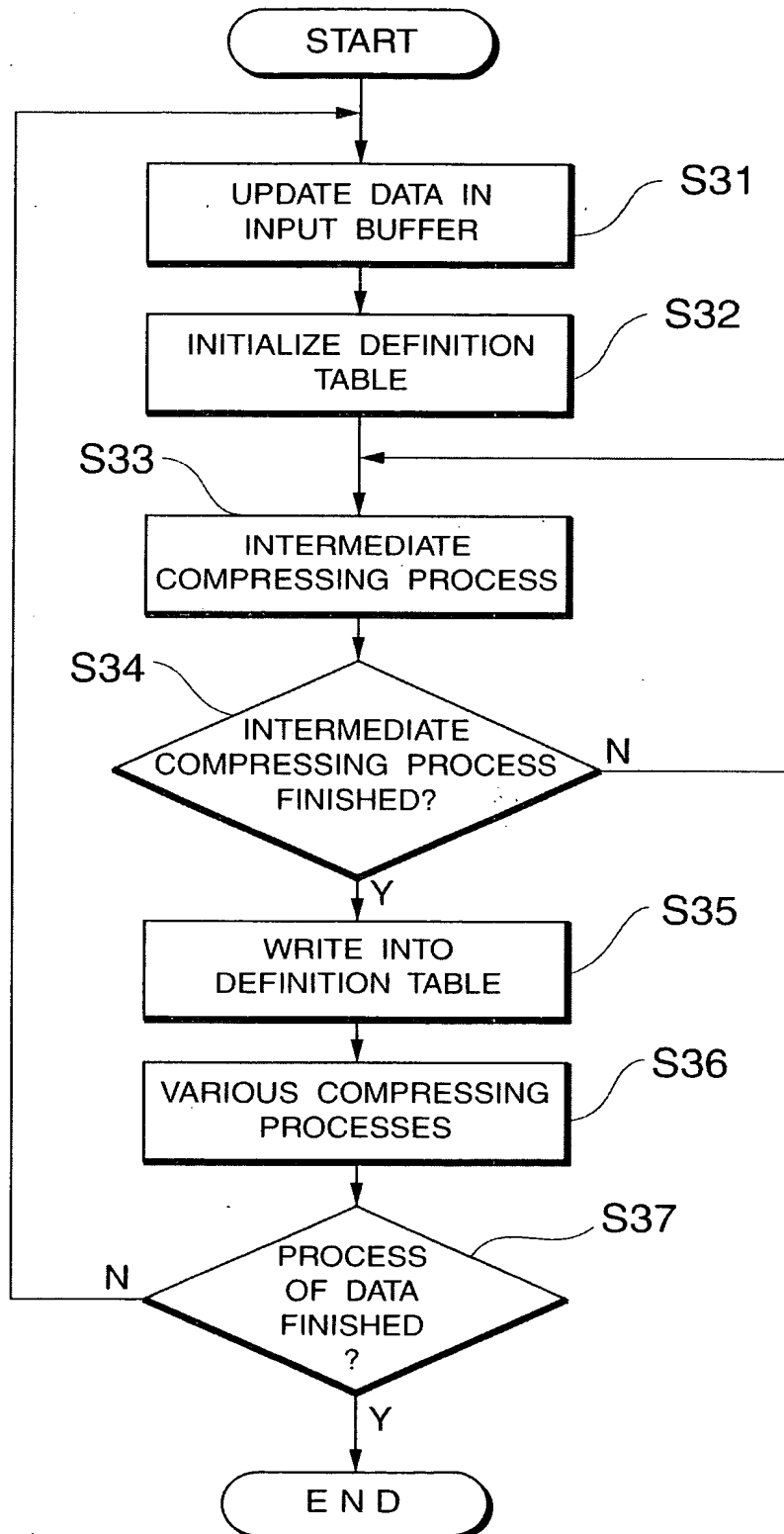
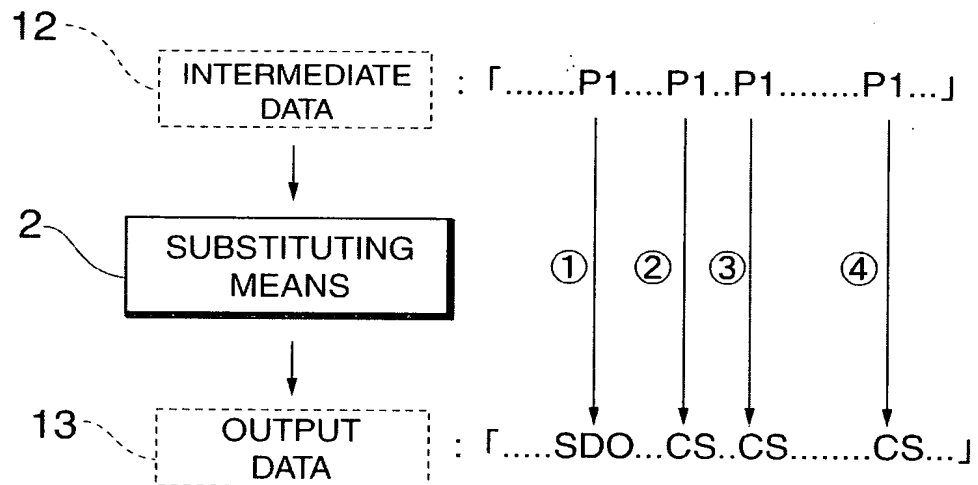
Fig. 18

Fig. 19

(a) IN THE CASE OF DEFINING ONE POINTER



(b) IN THE CASE OF DEFINING A PLURALITY OF POINTERS

